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REMARKS

Claims 5-20 were pending in the application prior to this response. Claims 5-7, 11, 13, 14 and 18-20 have been amended herein. Claims 8-10, 12, 15 and 16 have been canceled. Claim 17 remains in the application unchanged by this amendment. New claims 21-23 have been added. Accordingly, after entry of this amendment, claims 5-7, 11, 13, 14 and 17-23 will be pending in the application. Reexamination and reconsideration are requested.

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I. Legal Basis for Prior Art Claim Rejections Applied in the Office Action

Anticipation under 35 U.S.C. §102

The standard for lack of novelty, that is, for "anticipation," under 35 U.S.C. 102 is one of strict identity. To anticipate a claim for a patent, a single prior source must contain all its essential elements. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81, 90 (Fed. Cir. 1986).

Obviousness Under 35 U.S.C. §103

The test for obviousness under 35 U.S.C. 103 is whether the claimed invention would have been obvious to those skilled in the art in light of the knowledge made available by the reference or references. *In re Donovan*, 184 USPQ 414, 420, n. 3 (CCPA 1975). It requires consideration of the entirety of the disclosures of the references. *In re Rinehart*, 189 USPQ 143, 146 (CCPA 1976). All limitations of the Claims must be considered. *In re Boe*, 184 USPQ 38, 40 (CCPA 1974). In making a determination as to obviousness, the references must be read without benefit of applicants' teachings. *In re Meng*, 181 USPQ 94, 97 (CCPA 1974). In addition, the propriety of a Section 103 rejection is to be determined by whether the reference teachings appear to be sufficient for one of ordinary skill in the relevant art having the references before him to make the proposed substitution, combination, or other modifications. *In re Lintner*, 173 USPQ 560, 562 (CCPA 1972).

In the case of *In re Wright*, 6 USPQ 2d 1959 (CAFC 1988), the CAFC decided that the Patent Office had improperly combined references which did not suggest the properties and results of the applicants' invention nor suggest the claimed combination as a solution to the problem which applicants' invention solved.

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The CCPA reached this conclusion after an analysis of the prior case law, at p. 1961:

We repeat the mandate of 35 U.S.C. 103: it is the invention as a whole that must be considered in obviousness determinations. The invention as a whole embraces the structure, its properties, and the problem it solves. See, e.g., *Cable Electric Products, Inc. v. Genmark, Inc.*, 770 F.2d 1015, 1025, 226 USPQ 881, 886 (Fed. Cir. 1985) ("In evaluating obviousness, the hypothetical person of ordinary skill in the pertinent art is presumed to have the 'ability to select and utilize knowledge from other arts reasonably pertinent to [the] particular problem' to which the invention is directed"), quoting *In re Antle*, 444 F.2d 1168, 1171-72, 170 USPQ 285, 287-88 (CCPA 1971); *In re Antonie*, 559 F.2d 618, 619, 195 USPQ 6, 8 (CCPA 1977) ("In delineating the invention as a whole, we look not only in the claim in question... but also to those properties of the subject matter which are inherent in the subject matter and are disclosed in the specification") (emphasis in original).

The determination of whether a novel structure is or is not "obvious" requires cognizance of the properties of that structure and the problem which it solves, viewed in light of the teachings of the prior art. See, e.g., *In re Rinehart*, 531 F.2d 1048, 1054, 189 USPQ 143, 149 (CCPA 1976) (the particular problem facing the inventor must be considered in determining obviousness); see also *Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co.*, 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed. Cir. 1984) (it is error to focus "solely on the product created, rather than on the obviousness or notoriousness of its creation") (quoting *General Motors Corp. v. U.S. Int'l Trade Comm'n*, 687 F.2d 476, 483, 215 USPQ 484, 489 (CCPA 1982), cert. denied, 459 U.S. 1105 (1983)).

Thus the question is whether what the inventor did would have been obvious to one of ordinary skill in the art attempting to solve the problem upon which the inventor was working. *Rinehart*, 531 F.2d at 1054, 189 USPQ at 149; see also *In re Benno*, 768 F.2d 1340, 1345, 226 USPQ 683, 687 (Fed. Cir. 1985) ("appellant's problem" and the prior art present different problems requiring different solutions").

A basic mandate inherent in Section 103 is that a piecemeal reconstruction of prior art patents shall not be the basis for a holding of obviousness. It is impermissible within the framework of Section 103 to pick

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and choose from any one reference only so much of it as will support a given position, to the exclusion of other parts necessary to the full appreciation of what such reference fairly suggests to one of ordinary skill in the art. *In re Kamm*, 172 USPQ 298, 301-302 (CCPA 1972). Phrased somewhat differently, the fact that inventions of the references and of applicants may be directed to concepts for solving the same problem does not serve as a basis for arbitrarily choosing elements from references to attempt to fashion applicants' claimed invention. *In re Donovan*, 184 USPQ 414, 420 (CCPA 1975).

It is also clearly established in the case law that a change in the mode of operation of a device which renders that device inoperative for its stated utility as set forth in the cited reference renders the reference improper for use to support an obviousness-type rejection predicated on such a change. See, e.g., *Diamond International Corp. v. Walterhoefer*, 289 F.Supp. 550, 159 USPQ 452, 460-61 (D.Md. 1968); *Ex parte Weber*, 154 USPQ 491, 492 (Bd.App. 1967). In addition, any attempt to combine the teaching of one reference with that of another in such a manner as to render the invention of the first reference inoperative is not permissible. See, e.g., *Ex parte Hartmann*, 186 USPQ 366 (Bd.App. 1974); and *Ex parte Sternau*, 155 USPQ 733 (Bd.App. 1967).

A reference which teaches away from the applicants' invention may not properly be used in framing a 35 U.S.C. 103 rejection of applicants' claims. See *United States v. Adams*, 148 USPQ 429 (Sup. Ct. 1966).

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II. Rejection of Claims 5-10 and 17-19 under 35 U.S.C. §102(b)

Claims 5-10 and 17-19 stand rejected under 35 §U.S.C. 102(b) as being clearly anticipated by Zaleckas (U.S. 4,091,529). Reconsideration is requested.

Claim 5

Claim 5, as amended herein, recites the following:

An apparatus comprising:

a printed circuit board;

a U-shaped metalized pad deposited on a surface of the printed circuit board; [and]

a solder mound contacting the U-shaped metalized pad, the solder mound having a U-shaped lateral cross section conforming to the U-shaped metalized pad;

said solder mound comprising a lateral bridge portion and first and second arm extremities extending in a longitudinal direction away from the bridge portion along the surface of the printed circuit board;

each of said first and second arm extremities having a first portion proximate said bridge portion and an oppositely-disposed second portion proximate a terminal end of said arm extremities; and

a means [coupled with the U-shaped metalized pad] for registering an extremity of a component lead with respect to the pad, said means comprising a tapered aperture formed between said first and second arm extremity second portions.

Claim 5 has been amended as indicated above. The language added to claim 5 is fully supported by the originally-filed application with reference, for example, to drawing Figs. 4-11, the originally-filed claims and the written

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specification at page 8, line 27 through page 9, line 16. No new matter has been added.

Claim 5 recites the following:

a solder mound contacting the U-shaped metalized pad, the solder mound having a U-shaped lateral cross section conforming to the U-shaped metalized pad;

Zaleckas does not disclose or suggest a solder mound as recited. Instead of soldering, Zaleckas discussed bonding the leads 17 to the bond sites 19 (e.g., Fig. 4) by a process of thermocompression bonding. Zaleckas sets forth the following:

In accordance with prior art techniques, mechanical and electrical interconnections between the leads 17 and the pattern 15 are typically formed by bonding one end 18 of each of the leads 17 to a corresponding bond site 19 on the substrate 12. A bond is typically formed by **thermocompression bonding** whereby a metal-to-metal bond is effected through the application of physical force as well as thermal energy. The leads 17 are typically at least coated with a metal, such as gold, that permits a ready bond to a top layer of the same metal on the substrate 12. The compressive force of a thermode (not shown) deforms the material of the leads 17 during the bonding operation into contact areas which are wider than the original widths of the leads 17.

(column 3, lines 3-16, emphasis added)

Accordingly, Zaleckas does not disclose a solder mound as recited in applicants' claim 5.

Claim 5 further recites the following:

a means for registering an extremity of a component lead with

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respect to the pad, said means comprising a tapered aperture formed between said first and second arm extremity second portions.

Zaleckas clearly does not disclose or suggest a tapered aperture as recited in claim 5.

For at least the reasons set forth above, applicants respectfully assert that Zaleckas fails to disclose all of the limitations of applicants' claim 5. Accordingly, claim 5 is not anticipated by Zaleckas. As stated previously, to anticipate a claim for a patent, a single prior source must contain all its essential elements. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81, 90 (Fed. Cir. 1986).

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Claims 6-10 and 17-19

Claim 6, as amended herein, recites the following:

An apparatus comprising:
a printed circuit board;
a U-shaped metalized pad deposited on a surface of the printed circuit board;
a solder mound contacting the U-shaped metalized pad, the solder mound having a U-shaped lateral cross section conforming to the U-shaped metalized pad;
said solder mound comprising a lateral bridge portion and first and second arm extremities extending in a longitudinal direction away from the bridge portion along the surface of the printed circuit board;
each of said first and second arm extremities having a first portion proximate said bridge portion and an oppositely-disposed second portion proximate a terminal end of said arm extremities; and
a tapered aperture formed between said first and second arm extremity second portions.

Claim 6 has been amended as indicated above. The language added to claim 6 is fully supported by the originally-filed application with reference, for example, to drawing Figs. 4-11, the originally-filed claims and the written specification at page 8, line 27 through page 9, line 16. No new matter has been added.

Claim 6 recites the following:

a solder mound contacting the U-shaped metalized pad, the solder mound having a U-shaped lateral cross section conforming to

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the U-shaped metalized pad;

As discussed above, with respect to the rejection of claim 5, Zaleckas does not disclose or suggest a solder mound.

Claim 6 further recites the following:

a tapered aperture formed between said first and second arm extremity second portions.

Zaleckas clearly does not disclose or suggest a tapered aperture as recited in claim 6.

For at least the reasons set forth above, applicants respectfully assert that Zaleckas fails to disclose all of the limitations of applicants' claim 5. Accordingly, claim 5 is not anticipated by Zaleckas. As stated previously, to anticipate a claim for a patent, a single prior source must contain all its essential elements. *Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 231 USPQ 81, 90 (Fed. Cir. 1986).

Claims 7 and 17-19 are allowable at least as ultimately depending from allowable base claim 6. Claims 8-10 have been canceled.

Claim 7 has been amended herein in a manner consistent with the amendments to base claim 6, as discussed above. Claims 18 and 19 have been amended to correct an obvious error in dependency

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III. Rejection of Claims 11-16 and 20 under 35 U.S.C. §103(a)

Claims 11-16 and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Zaleckas (U.S. 4,091,529). Reconsideration is requested.

Claims 11, 13, 14 and 20 are allowable at least as ultimately depending from allowable base claim 6. Claims 12, 15 and 16 have been canceled. Claims 11, 13, 14 and 20 are allowable on further independent grounds for the reasons set forth below.

The Examiner states the following on page 4 of the Office action:

Regarding claims 11-16 and 20, while Zaleckas fails to teach the exact dimensions of the pad and the mound, it would have been obvious to one ordinary skill in the art at the time of the invention to optimize these dimensions through routine experimentation (MPEP 2144.05).

The Examiner, thus, admits that neither Zaleckas nor any of the other references of record provide any teaching, whatsoever, of applicants' recited dimensions. Applicants' assert that these dimensions are not a matter within the knowledge of a person of ordinary skill in the art and the Examiner has submitted no evidence to the contrary. Accordingly, there is absolutely nothing in the file history of this prosecution to support the Examiner's statement. There must be something in the teachings of cited references to suggest to an individual skilled in the art that a claimed invention would be obvious. *W. L. Gore and Associates v. Garlock, Inc.*, 220 USPQ 303, 311 (Fed. Cir. 1983), *cert. denied*, 469 U.S. 851 (1984). "There must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from the applicant's disclosure." *In re Dow Chemical Co.*, 5 USPQ2d 1529, 1532 (Fed. Cir. 1988).

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Claims 11, 13 and 14 have been amended herein in a manner consistent with the amendments to base claim 6, as discussed above. Claim 20 has been amended to correct an obvious error in dependency.

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IV. New Claims 21-23

New claim 21 is dependent on base claim 5 and recites the following:

21. An apparatus as in claim 5 and further wherein:
each of said first and second arm extremity second portions is tapered in the longitudinal direction away from said bridge portion along the surface of said printed circuit board, thus forming a first taper on said first arm extremity and a second taper on said second arm extremity; and
said tapered aperture comprises said first and second tapers.

New claim 21 is fully supported by the originally-filed application with reference, for example, to drawing Figs. 4-11, the originally-filed claims and the written specification at page 8, line 27 through page 9, line 16. No new matter has been added.

New claim 22 depends from base claim 6 and recites the following:

22. An apparatus as in claim 6 and further wherein:
each of said first and second arm extremity second portions is tapered in the longitudinal direction away from said bridge portion along the surface of said printed circuit board, thus forming a first taper on said first arm extremity and a second taper on said second arm extremity; and
said tapered aperture comprises said first and second tapers.

New claim 22 is fully supported by the originally-filed application with reference, for example, to drawing Figs. 4-11, the originally-filed claims and the written specification at page 8, line 27 through page 9, line 16. No new matter has been added.

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New claim 23 depends from base claim 6 and recites the following:

23. An apparatus as in claim 6 wherein the solder mound has a height dimension within a range of five thousandths of an inch to twenty thousands of an inch.

New claim 23 is fully supported by the originally-filed application with reference, for example, to originally-filed claim 16. No new matter has been added.

In view of the above, all of the claims are now believed to be in condition for allowance.

Respectfully submitted,

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